

AMENDMENTS TO THE CLAIMS:

1. (Original) A polishing method for polishing a workpiece, comprising:
polishing a surface of a workpiece by pressing said surface of said workpiece against a polishing surface of a polishing table under a predetermined force;
polishing an outer peripheral portion of said workpiece before or after said polishing of said surface of said workpiece by pressing said outer peripheral portion of said workpiece against an outer periphery polishing surface of a rotating outer periphery polishing unit; and
directing a polishing liquid to said rotating outer periphery polishing unit about a rotational center thereof such that said polishing liquid is supplied to said outer periphery polishing surface via centrifugal force caused by the rotation of said outer periphery polishing unit.
2. (Original) The polishing method according to claim 1, wherein pressing said surface of said workpiece against said polishing surface comprises holding said workpiece with a top ring and pressing said workpiece against said polishing surface via said top ring.
3. (Original) The polishing method according to claim 2, wherein polishing said outer peripheral portion said workpiece comprises holding said workpiece with said top ring and pressing said outer peripheral portion of said workpiece against said outer periphery polishing surface of said rotating outer periphery polishing unit.
4. (Original) The polishing method according to claim 1, wherein said workpiece comprises a substrate on which copper interconnects are formed.
5. (Original) The polishing method according to claim 4, wherein said polishing liquid has a polishing rate for copper which is at least ten times greater than that for an oxide film or a low-K material.
6. (Withdrawn) An outer periphery polishing apparatus for polishing an outer peripheral portion of a substrate, comprising:

a substrate holder for holding a substrate so as to allow an outer peripheral portion of the substrate to be exposed;

a polishing unit having a polishing surface that is located so as to face the outer peripheral portion of the substrate while the substrate is held by said substrate holder;

a rotating mechanism for rotating at least one of said substrate holder and said polishing unit;
and

a moving mechanism for moving at least one of said substrate holder and said polishing unit to bring said substrate holder and said polishing unit into engagement with each other and to separate said substrate holder and said polishing unit from engagement with each other;

wherein said polishing unit is rotatable about a rotational axis, and includes a polishing liquid supply port around said rotational axis for supplying a polishing liquid to said polishing surface via centrifugal force caused by rotation of said polishing unit about said rotational axis.

7. (Withdrawn) The polishing apparatus according to claim 6, wherein said outer periphery polishing surface exhibits an upwardly extending inclination with respect to a horizontal plane defined by the substrate while the substrate is being held by said top ring, with said upwardly extending inclination being directed in a radially outward direction with respect to the substrate while the substrate is being held by said top ring.

8. (Withdrawn) The outer periphery polishing apparatus according to claim 6, wherein the substrate comprises a substrate on which copper interconnects are formed.

9. (Withdrawn) The outer periphery polishing apparatus according to claim 8, wherein the polishing liquid has a polishing rate for copper which is at least ten times greater than that for an oxide film or a low-K material.

10. (Withdrawn) The outer periphery polishing apparatus according to claim 6, further comprising a pressing mechanism for pressing the outer peripheral portion of the substrate against said polishing surface of said polishing unit.

11. (Withdrawn) The polishing apparatus according to claim 10, wherein said outer periphery polishing surface exhibits an upwardly extending inclination with respect to a horizontal plane defined by the substrate while the substrate is being held by said top ring, with said upwardly extending inclination being directed in a radially outward direction with respect to the substrate while the substrate is being held by said top ring.

12. (Withdrawn) A polishing apparatus for polishing a workpiece, comprising:
a surface polishing mechanism for polishing a surface of a workpiece, said surface polishing mechanism including a polishing table having a polishing surface and a top ring for holding the workpiece and pressing the workpiece against said polishing surface of said polishing table; and
an outer periphery polishing unit having an outer periphery polishing surface for polishing an outer peripheral portion of the workpiece;
wherein said outer periphery polishing unit is rotatable about a rotational axis, and includes a polishing liquid supply port around said rotational axis for supplying a polishing liquid to said outer periphery polishing surface via centrifugal force caused by rotation of said outer periphery polishing unit about said rotational axis.

13. (Withdrawn) The polishing apparatus according to claim 12, wherein said top ring is movable in a vertical direction and a horizontal direction, and said outer periphery polishing unit is disposed at a location to which said top ring is movable and has said outer periphery polishing surface for polishing the outer peripheral portion of the workpiece by contacting the outer peripheral portion of the workpiece while the workpiece is being held by said top ring.

14. (Withdrawn) The polishing apparatus according to claim 12, wherein the workpiece comprises a substrate on which copper interconnects are formed.

15. (Withdrawn) The polishing apparatus according to claim 14, wherein the polishing liquid has a polishing rate for copper which is at least ten times greater than that for an oxide film or a low-K material.

16. (Withdrawn) The polishing apparatus according to claim 12, wherein said outer periphery polishing surface exhibits an upwardly extending inclination with respect to a horizontal plane defined by the workpiece while the workpiece is being held by said top ring, with said upwardly extending inclination being directed in a radially outward direction with respect to the workpiece while the workpiece is being held by said top ring.

17. (Original) A polishing method for polishing a workpiece having a film formed thereon, said polishing method comprising:

polishing a surface of a workpiece by pressing said surface of said workpiece against a polishing surface of a polishing table under a predetermined force;

polishing an outer peripheral portion of said workpiece before or after said polishing of said surface of said workpiece by pressing said outer peripheral portion of said workpiece against an outer periphery polishing surface of a rotating outer periphery polishing unit; and

directing a polishing liquid to said rotating outer periphery polishing unit about a rotational center thereof such that said polishing liquid is supplied to said outer periphery polishing surface via centrifugal force caused by the rotation of said outer periphery polishing unit.

18. (Withdrawn) An outer periphery polishing apparatus for polishing an outer peripheral portion of a substrate having a film formed thereon, said outer periphery polishing apparatus comprising:

a substrate holder for holding a substrate so as to allow an outer peripheral portion of the substrate to be exposed;

a polishing unit having a polishing surface that is located so as to face the outer peripheral portion of the substrate while the substrate is held by said substrate holder;

a rotating mechanism for rotating at least one of said substrate holder and said polishing unit; and

a moving mechanism for moving at least one of said substrate holder and said polishing unit to bring said substrate holder and said polishing unit into engagement with each other and to separate said substrate holder and said polishing unit from engagement with each other;

wherein said polishing unit is rotatable about a rotational axis, and includes a polishing liquid supply port around said rotational axis for supplying a polishing liquid to said polishing surface via centrifugal force caused by rotation of said polishing unit about said rotational axis.

19. (Withdrawn) A polishing apparatus for polishing a workpiece having a film formed thereon, said polishing apparatus comprising:

a surface polishing mechanism for polishing a surface of a workpiece, said surface polishing mechanism including a polishing table having a polishing surface and a top ring for holding the workpiece and pressing the workpiece against said polishing surface of said polishing table; and

an outer periphery polishing unit having an outer periphery polishing surface for polishing an outer peripheral portion of the workpiece;

wherein said outer periphery polishing unit is rotatable about a rotational axis, and includes a polishing liquid supply port around said rotational axis for supplying a polishing liquid to said outer periphery polishing surface via centrifugal force caused by rotation of said outer periphery polishing unit about said rotational axis.

20. (Original) A polishing method for polishing a workpiece, comprising:

polishing a surface of a workpiece by pressing said surface of said workpiece against a polishing surface;

polishing an outer peripheral portion of said workpiece before or after said polishing of said surface of said workpiece by pressing said outer peripheral portion of said workpiece against an outer periphery polishing surface of a rotating outer periphery polishing unit; and

directing a polishing liquid to said rotating outer periphery polishing unit about a rotational center thereof.

21. (New) A polishing method for polishing a workpiece, comprising:

holding a workpiece with a top ring and pressing a surface of said workpiece against a polishing surface of a polishing table so as to polish said surface of said workpiece;

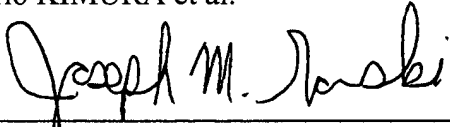
polishing an outer peripheral portion of said workpiece before or after the polishing of said surface of said workpiece by pressing said outer peripheral portion of said workpiece against an outer periphery polishing surface provided so as to substantially surround said outer peripheral portion of said workpiece.

22. (New) The polishing method according to claim 21, further comprising:

holding said workpiece by said top ring while said outer peripheral portion of said workpiece is polished.

Respectfully submitted,

Norio KIMURA et al.

By: 

Joseph M. Gorski
Registration No. 46,500
Attorney for Applicants

JMG/edg
Washington, D.C. 20006-1021
Telephone (202) 721-8200
Facsimile (202) 721-8250
October 22, 2004